

Presentation Type:

Poster Presentation

Access to Alcohol-Based Hand Rub Is Associated With Improved Hand Hygiene in an Ebola-Threatened District of Western Uganda

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Background: Ebola virus disease (EVD) is highly transmissible and has a high mortality rate. During outbreaks, EVD can spread across international borders. Inadequate hand hygiene places healthcare workers (HCWs) at increased risk for healthcare-associated infections, including EVD. In high-income countries, alcohol-based hand rub (ABHR) can improve hand hygiene compliance among HCWs in healthcare facilities (HCF). We evaluated local production and district-wide distribution of a WHO-recommended ABHR formulation and associations between ABHR availability in HCF and HCW hand hygiene compliance. **Methods:** The evaluation included 30 HCF in Kabarole District, located in Western Uganda near the border with the Democratic Republic of the Congo, where an EVD outbreak has been ongoing since August 2018. We recorded baseline hand hygiene practices before and after patient contact among 46 healthcare workers across 20 HCFs in August 2018. Subsequently, in late 2018, WHO/UNICEF distributed commercially produced ABHR to all 30 HCFs in Kabarole as part of Ebola preparedness efforts. In February 2019, our crossover evaluation distributed 20 L locally produced ABHR to each of 15 HCFs. From June 24–July 5, 2019, we performed follow-up observations of hand hygiene practices among 68 HCWs across all 30 HCFs. We defined hand hygiene as handwashing with soap or using ABHR. We conducted focus groups with healthcare workers at baseline and follow-up. **Results:** We observed hand hygiene compliance before and after 203 and 308 patient contacts at baseline and follow-up, respectively. From baseline to follow-up, hand hygiene compliance before patient contact increased for ABHR use (0% to 17%) and handwashing with soap (0% to 5%), for a total increase from 0% to 22% ($P < .0001$). Similarly, hand hygiene after patient contact increased from baseline to follow-up for ABHR use (from 3% to 55%), and handwashing with soap decreased (from 12% to 7%), yielding a net increase in hand hygiene compliance after patient contact from 15% to 62%

($P < .0001$). Focus groups found that HCWs prefer ABHR to handwashing because it is faster and more convenient. **Conclusions:** In an HCF in Kabarole District, the introduction of ABHR appeared to improve hand hygiene compliance. However, the confirmation of 3 EVD cases in Uganda 120 km from Kabarole District 2 weeks before our follow-up hand hygiene observations may have influenced health-care worker behavior and hand hygiene compliance. Local production and district-wide distribution of ABHR is feasible and may contribute to improved hand hygiene compliance among healthcare workers.

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Poster Presentation

Accuracy of the NHSN Central-Line–Associated Bloodstream Infections (CLABSIs) Definition: The Experience of Two Geographically Proximal Hospitals

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Background: Central-line–associated blood stream infections (CLABSIs) are linked with significant morbidity and mortality. A NHSN laboratory-confirmed bloodstream infection (LCBSI) has specific criteria to ascribe an infection to the central line or not. The criteria used to associate the pathogen to another site are restrictive. This objective to better classify CLABSIs using enhanced criteria to gain a comprehensive understanding of the error so that appropriate reduction efforts are utilized. **Methods:** We conducted a retrospective review of medical records with NHSN-identified CLABSI from July 2017 to December 2018 at 2 geographically proximate hospitals. Trained infectious diseases personnel from tertiary-care academic medical centers, the University of Virginia Health System, a 600-bed medical center in Charlottesville, Virginia, and Virginia Commonwealth University Health System with 865 beds in Richmond, Virginia, reviewed charts. We defined “overcaptured” or O-CLABSI into different categories: O-CLABSI-1 is bacteremia attributable to a primary infectious source; O-CLABSI-2 is bacteremia attributable to neutropenia with gastrointestinal translocation not meeting mucosal barrier injury criteria; O-CLABSI-3 is a positive

Table 1.

Table 1. Summary of O-CLABSI Classifications between Hospitals A and B, July 2017–December 2018

	Hospital A		Hospital B		P values
Total NHSN CLABSI	59		133		
True CLABSI	25	42%	88	66%	
Total O-CLABSI	34	58%	45	34%	0.0020
O-CLABSI distribution	34		45		
O-CLABSI-1	22*	64%	34	76%	<0.0001
O-CLABSI-2	7	21%	3	7%	<0.0001
O-CLABSI-3	5*	15%	8	18%	<0.0001
O-CLABSI-4	1	3%	0	0.0%	

O-CLABSI-1: bacteremia attributable to a primary infectious source

O-CLABSI-2: bacteremia attributable to neutropenia with gastrointestinal (GI) translocation not meeting mucosal barrier injury (MBI) criteria

O-CLABSI-3: positive blood culture attributable to a contaminant.

O-CLABSI-4: Patient Injecting Line, NOT documented

*One CLABSI identified as both O-CLABSI-1 and O-CLABSI-3.

blood culture attributable to a contaminant; and O-CLABSI-4 is a patient injecting line, though not officially documented. Descriptive analyses were performed using the χ^2 and the Fisher exact tests. **Results:** We found a large number of O-CLABSIs on chart review (79 of 192, 41%). Overall, 56 of 192 (29%) LCBSIs were attributable to a primary infectious source not meeting NHSN definition. O-CLABSI proportions between the 2 hospitals were statistically different; hospital A identified 34 of 59 (58%) of their NHSN-identified CLABSIs as O-CLABSIs, and hospital B identified a 45 of 133 (34%) as O-CLABSIs ($P = .0020$) (Table 1). When comparing O-CLABSI types, hospital B had a higher percentage of O-CLABSI-1 compared to hospital B: 76% versus 64%. Hospital A had a higher proportion of O-CLABSI-2: 21 versus 7%. Hospitals A and B had similar proportion of O-CLABSI-3: 15% versus 18%. These values were all statistically significant ($P < .0001$). **Discussions:** The results of these 2 geographically proximate systems indicate that O-CLABSIs are common. Attribution can vary significantly between institutions, likely depending on differences in incidence of true CLABSI, patient populations, protocols, and protocol compliance. These findings have implications for interfacility comparisons of publicly reported data. Most importantly, erroneous attribution can result in missed opportunity to direct patient safety efforts to the root cause of the bacteremia and could lead to inappropriate treatment.

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Poster Presentation

Aggressive Colonization Screening and Infection Control Measures in Containment of NDM-5 Carbapenemase-Producing CRE

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Background: In April 2019, Nebraska Public Health Laboratory identified an NDM-producing *Enterobacter cloacae* from a urine sample from a rehabilitation inpatient who had recently received care in a specialized unit (unit A) of an acute-care hospital (ACH-A). After additional infections occurred at ACH-A, we conducted a public health investigation to contain spread. **Methods:** A case was defined as isolation of NDM-producing carbapenem-resistant Enterobacteriaceae (CRE) from a patient with history of admission to ACH-A in 2019. We conducted clinical culture surveillance, and we offered colonization screening for carbapenemase-producing organisms to all patients admitted to unit A since February 2019. We assessed healthcare facility infection control practices in ACH-A and epidemiologically linked facilities by visits from the ICAP (Infection Control Assessment and Promotion) Program. The recent medical histories of case patients were reviewed. Isolates were evaluated by whole-genome sequencing (WGS). **Results:** Through June 2019, 7 cases were identified from 6 case patients: 4 from clinical cultures and 3 from 258 colonization screens including 1 prior unit A patient detected as an outpatient (Fig. 1). Organisms isolated were *Klebsiella pneumoniae* ($n = 5$), *E. cloacae* ($n = 1$), and *Citrobacter freundii* ($n = 1$); 1 patient had both NDM-producing *K. pneumoniae* and *C. freundii*. Also, 5 case patients had overlapping stays in unit A during February–May 2019 (Fig. 2); common exposures in unit A included rooms in close proximity, inhabiting the same room at different times and shared caregivers. One case-patient was not admitted to unit A but shared caregivers, equipment, and devices (including a colonoscope) with other case patients while admitted to other ACH-A units. No case patients reported travel outside the United States. Screening at epidemiologically linked facilities and clinical culture surveillance showed no evidence of transmission beyond ACH-A. Infection control assessments at ACH-A revealed deficiencies in hand hygiene, contact precautions adherence, and incomplete cleaning of shared equipment within and used to transport to/from a treatment room in unit A. Following implementation of recommended infection control interventions, no further cases were identified. Finally, 5 *K. pneumoniae* of ST-273 were related by WGS including carriage of NDM-5 and IncX3 plasmid supporting transmission of this strain. Further analysis is required to relate IncX3 plasmid carriage and potential transmission to other organisms and sequence types identified in this study. **Conclusions:** We identified a multi-organism outbreak of NDM-5–producing CRE in an ACH specialty care unit. Transmission was controlled through improved

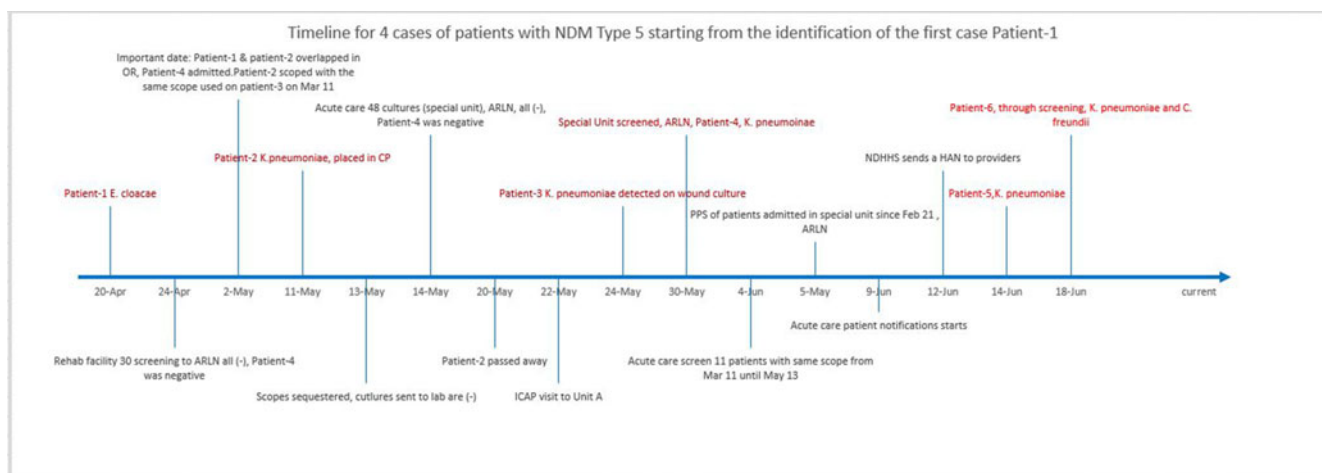


Fig. 1